

WHAT IS CLAIMED IS:

1 1. A method for generating a table for enhancing the print quality of input
2 raster pel`data, comprising:
3 generating an output value for different patterns of pel data, wherein each
4 output value indicates a sub-pulse width power to charge to a sub-pel region within a
5 pel and position information indicating the justification of the sub-pel region within
6 the pel; and
7 forming a look-up table from the generated output values that enhances print
8 quality.

1 2. The method of claim 1, wherein toner is attracted to the charged sub-
2 pel region.

1 3. The method of claim 1, wherein one output value is generated for a
2 subject pel depending upon the pattern of pels surrounding the subject pel, wherein
3 there is one output value for each possible pattern of surrounding pels.

1 4. The method of claim 3, wherein the subject pel is at the center of the
2 surrounding pels, and wherein the surrounding pels form a diamond shape.

1 5. The method of claim 1, wherein the position information is used to
2 cluster sub-pel regions next to each other in adjacent pels and justify an edge pel
3 toward a black filled region adjacent to the edge pel.

1 6. The method of claim 1, wherein the output value for the sub-pulse
2 width power is generated by adjusting a base sub-pulse width power by weights
3 indicating the affect of a subject black pel on surrounding pels.

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1 7. The method of claim 6, wherein the output value is generated for the
2 subject black pel affecting the surrounding pels, wherein the surrounding pels
3 comprise multiple regions of pels, wherein there is a separate weight for each region
4 that is used to adjust the base sub-pulse width power of the subject black pel to
5 produce the output value.

1 8. The method of claim 6, wherein, for each region, there is a black
2 weight indicating the affect of the subject black pel on a black pel in the region and a
3 white weight indicating the affect of the subject black pel on a white pel in the region,
4 wherein adjusting the base sub-pulse width power for the subject black pel comprises,
5 for each region:

6 adding the black weight to the sub-pulse width power for each black pel in the
7 region; and

8 subtracting the white weight from the sub-pulse width power for each white
9 pel in the region.

1 9. The method of claim 7, wherein the for each region are calculated by
2 solving an equation that uses the weights for each region to adjust an input array
3 comprising the density at each greyscale level at the base sub-pulse width power to
4 produce a target output array comprising desired density for each greyscale level.

1 10. The method of claim 9, wherein the adjustment of the input array using
2 the weights is performed by adding a first function defining the density of the pels in
3 the regions for each greyscale level after adjusting the subject black pel with the
4 weights, subtracting a second function defining the density of the pels in the regions
5 for each greyscale level with no weight affect, adding a third function defining the
6 density of the black subject pel for each greyscale level after adjusting the center pel
7 with the weights, and subtracting a fourth function defining the density of the black
8 subject pel with no weight affect.

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1 11. The method of claim 10, wherein the four functions defining the affect
2 of the black subject pel in each region are based on a greyscale level corresponding to
3 a percentage of the subject black pel that affects the region measured at different
4 power levels.

1 12. The method of claim 11, wherein the affect of the subject black pel in
2 each region further comprises:

3 using the halftone algorithm to determine, for each region, black and white
4 density arrays indicating a percentage of black and white pels, respectively, in the
5 region for each greyscale level; and
6 for each region, multiplying the black and white density arrays and the results
7 of the functions indicating the affect of the subject black pel on the region to
8 determine the black and white density effects of the subject black pel on the region.

1 13. A system for generating a table for enhancing the print quality of input
2 raster pel data, comprising:

3 means for generating an output value for different patterns of pel data,
4 wherein each output value indicates a sub-pulse width power to charge to a sub-pel
5 region within a pel and position information indicating the justification of the sub-pel
6 region within the pel; and

7 means for forming a look-up table from the generated output values that
8 enhances print quality.

1 14. The system of claim 13, wherein toner is attracted to the charged sub-
2 pel region.

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1 15. The system of claim 13, wherein one output value is generated for a
2 subject pel depending upon the pattern of pels surrounding the subject pel, wherein
3 there is one output value for each possible pattern of surrounding pels.

1 16. The system of claim 15, wherein the subject pel is at the center of the
2 surrounding pels, and wherein the surrounding pels form a diamond shape.

1 17. The system of claim 13, wherein the position information is used to
2 cluster sub-pel regions next to each other in adjacent pels and justify an edge pel
3 toward a black filled region adjacent to the edge pel.

1 18. The system of claim 13, further comprising means for adjusting a base
2 sub-pulse width power by weights indicating the affect of a subject black pel on
3 surrounding pels to generate the output value for the sub-pulse width power.

1 19. The system of claim 18, wherein the output value is generated for the
2 subject black pel affecting the surrounding pels, wherein the surrounding pels
3 comprise multiple regions of pels, wherein there is a separate weight for each region
4 that is used to adjust the base sub-pulse width power of the subject black pel to
5 produce the output value.

1 20. The system of claim 18, wherein, for each region, there is a black
2 weight indicating the affect of the subject black pel on a black pel in the region and a
3 white weight indicating the affect of the subject black pel on a white pel in the region,
4 wherein the means for adjusting the base sub-pulse width power for the subject black
5 pel comprises, for each region:

6 means for adding the black weight to the sub-pulse width power for each
7 black pel in the region; and

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8 means for subtracting the white weight from the sub-pulse width power for
9 each white pel in the region.

1 21. The system of claim 19, further comprising means for calculating the
2 weights for each region by solving an equation that uses the weights for each region to
3 adjust an input array comprising the density at each gray scale level at the base sub-
4 pulse width power to produce a target output array comprising desired density for
5 each gray scale level.

1 22. The system of claim 21, wherein adjustment of the input array using
2 the weights is performed by adding a first function defining the density of the pels in
3 the regions for each gray scale level after adjusting the subject black pel with the
4 weights, subtracting a second function defining the density of the pels in the regions
5 for each gray scale level with no weight affect, adding a third function defining the
6 density of the black subject pel for each gray scale level after adjusting the center pel
7 with the weights, and subtracting a fourth function defining the density of the black
8 subject pel with no weight affect.

1 23. The system of claim 22, wherein the four functions defining the affect
2 of the black subject pel in each region are based on a gray scale level corresponding
3 to a percentage of the subject black pel that affects the region measured at different
4 power levels.

1 24. The system of claim 23, wherein the affect of the subject black pel in
2 each region is determined by:

3 means for using the halftone algorithm to determine, for each region, black
4 and white density arrays indicating a percentage of black and white pels, respectively,
5 in the region for each gray scale level; and

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8 forming a look-up table from the generated output values that enhances print
9 quality.

27. The article of manufacture of claim 25, wherein one output value is generated for a subject pel depending upon the pattern of pels surrounding the subject pel, wherein there is one output value for each possible pattern of surrounding pels.

1 29. The article of manufacture of claim 25, wherein the position
2 information is used to cluster sub-pel regions next to each other in adjacent pels and
3 justify an edge pel toward a black filled region adjacent to the edge pel.

1 30. The article of manufacture of claim 25, wherein the output value for
2 the sub-pulse width power is generated by adjusting a base sub-pulse width power by
3 weights indicating the affect of a subject black pel on surrounding pels.

1 31. The article of manufacture of claim 30, wherein the output value is
2 generated for the subject black pel affecting the surrounding pels, wherein the
3 surrounding pels comprise multiple regions of pels, wherein there is a separate weight
4 for each region that is used to adjust the base sub-pulse width power of the subject
5 black pel to produce the output value.

1 32. The article of manufacture of claim 30, wherein, for each region, there
2 is a black weight indicating the affect of the subject black pel on a black pel in the
3 region and a white weight indicating the affect of the subject black pel on a white pel
4 in the region, wherein adjusting the base sub-pulse width power for the subject black
5 pel comprises, for each region:

6 adding the black weight to the sub-pulse width power for each black pel in the
7 region; and

8 subtracting the white weight from the sub-pulse width power for each white
9 pel in the region.

1 33. The article of manufacture of claim 31, wherein the weights for each
2 region are calculated by solving an equation that uses the weights for each region to
3 adjust an input array comprising the density at each gray scale level at the base sub-
4 pulse width power to produce a target output array comprising desired density for
5 each gray scale level.

1 34. The article of manufacture of claim 33, wherein the adjustment of the
2 input array using the weights is performed by adding a first function defining the
3 density of the pels in the regions for each gray scale level after adjusting the subject

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4 black pel with the weights, subtracting a second function defining the density of the
5 pels in the regions for each gray scale level with no weight affect, adding a third
6 function defining the density of the black subject pel for each gray scale level after
7 adjusting the center pel with the weights, and subtracting a fourth function defining
8 the density of the black subject pel with no weight affect.

1 35. The article of manufacture of claim 34, wherein the four functions
2 defining the affect of the black subject pel in each region are based on a gray scale
3 level corresponding to a percentage of the subject black pel that affects the region
4 measured at different power levels.

1 36. The article of manufacture of claim 35, wherein the affect of the
2 subject black pel in each region further comprises:
3 using the halftone algorithm to determine, for each region, black and white
4 density arrays indicating a percentage of black and white pels, respectively, in the
5 region for each gray scale level; and
6 for each region, multiplying the black and white density arrays and the results
7 of the functions indicating the affect of the subject black pel on the region to
8 determine the black and white density effects of the subject black pel on the region.

1 37. A computer-readable transmission medium including at least one look-
2 up table data structure used for enhancing the print quality of input raster pel data,
3 comprising:

4 an output value for different patterns of pel data, wherein each output value
5 includes:

6 (i) a sub-pulse width power to charge to a sub-pel region within a pel,

7 and

8 (ii) position information indicating the justification of the sub-pel

9 region within the pel.

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1 38. The computer-readable transmission medium of claim 37, wherein the
2 look-up table data structure one output value for a subject pel depending upon the
3 pattern of pels surrounding the subject pel, wherein there is one output value for each
4 possible pattern of surrounding pels.

1 38. The computer-readable transmission medium of claim 37, wherein the
2 position information is used to cluster sub-pel regions next to each other in adjacent
3 pels and justify an edge pel toward a black filled region adjacent to the edge pel.

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